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RU Persei.

R.A. = $3^{h}\ 23^{m}\ 57^{s}$, Decl. = $+39^{\circ}\ 18'{\cdot}9$ (1900).

Observed Maxima.

E.	**Date.**	J.D. 241+	Computed Maximum.	O−C.	**Mag.**
				d	
0	1904 Nov. 28	6813	6814·0	−1·0	9·7
2	1905 Nov. 26	7176	7175·4	+0·6	9·4

Observed Minima.

			Computed Minimum.		
0	1904 Sept. 19	6743	6743·0	0·0	10·7
2	1905 Sept. 17	7106	7104·4	+1·6	10·4
3	1906 Mar. 14	7284	7285·1	−1·1	10·6

The adopted elements of variation derived from the above maxima and minima are :

$$\text{Maximum} = \left\{\begin{matrix}\text{1904 Nov. 29}\\ \text{J.D. 2416814}\end{matrix}\right\} + 180^{d}{\cdot}7\ \text{E},$$

the interval M—*m* being 71 days. The magnitude of the variable at maximum is 9·4–9·7 ; and at minimum it is 10·4–10·7.

Owing to the small range of variation, and to the fact that both the maximum and minimum brightness vary somewhat, I have not attempted to correct the above elements by means of the photographic observations published in the *A. N.* 3675. For the same reason the early B.D. observations published by Professor Küstner in the *A. N.* 3989 are not at present available for this purpose. Dr. E. Hartwig observed the star equal to B.D. +39°·803 (9·5 mag.) on 1905 October 20 (*A. N.* 4061). According to the observations made here it attained to equality with that star on 1905 October 19.

20 *Hove Park Villas, Hove :*
1906 *May* 1.

Observations of Jupiter in 1903 *and* 1905–6.

By W. F. Denning.

In *Monthly Notices,* lxiii. 331–4 (1903 April), I gave a summary of rotation periods of markings on *Jupiter* from observations at Bristol during the years 1898 to 1902 inclusive.

In continuation of these results I give the following table for the opposition of 1903 :—1388 transits were taken and 1188 of these were utilised in the determination of rotation periods :

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1903.

Markings.	Rotation Period. h m s	No. of Spots.	Mean No. Rotations.
N.N. Temperate	9 55 41·1	14	217
N. Temperate	9 55 54·3	9	291
N. Tropical	9 55 31·9	3	336
Equatorial	9 50 27·9	28	561
S. Tropical	9 55 43·0	2	141
Great Red Spot	9 55 41·6	1	608
Great S. Tropical	9 55 18·7	1	548
S. Temperate	9 55 18·5	9	320
S.S. Temperate	9 55 6·0	1	210

In 1904 I made very few observations in consequence of bad health, but resumed work on *Jupiter* at midsummer 1905, and continued it until the planet approached too near to the Sun (in 1906 May) for further effective observation.

1905-6.

Markings.	Rotation Period. h m s	No. of Spots.	Mean No. Rotations.
N. Tropical	9 55 55·2	1	58
Equatorial	9 50 32·7	24	448
Great Red Spot	9 55 41·5	1	761
Great S. Tropical	9 55 19·5	1	507 P end
„ „	9 55 23·6	1	641 F end
S. Temperate	9 55 20·3	7	353

Notes on the Apparition of 1905-6.

N.N.N. Temperate Spots.—There were signs of considerable disturbance in the region far north, about 40°–65°, and extensive irregularities in the N.N.N. Temperate Belt and N. Polar Cap were visible. These consisted of large white spots with very dark areas adjoining. A number of transits were taken, but they were insufficient to render the identifications certain and to enable perfectly safe rotation periods to be derived.

N.N. Temperate and N. Temperate Belts.—Very faint and only just traceable as delicate pencil-like shadings.

N. Tropical Spot.—This was discovered on 1906 April 10, and probably represented an extensive disturbance which had occurred only a few days previously; for I had examined the same region on April 3 and 7 without noticing anything unusual. When first seen the spot was very dark and distinct, and formed the *f* extremity of a slanting belt running to W.S.W. from the spot and joining the N. Equatorial Belt. Contemporary with

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this disturbance the N. Equatorial Belt, which in previous months had been extremely feeble, exhibited signs of rapid development, and especially in that region *p* the N. Tropical Spot and N. of the Great Red Spot. But the changes referred to, occurring, as they did, near the close of the apparition, could only be followed during a comparatively short interval (April 10 to May 4). The longitude of the N. Tropical Spot increased from 75° to 80° (System II.) in the twenty-four days included in the period alluded to, becoming increasingly conspicuous, so that it could be as definitely observed as a satellite-shadow, and was readily visible at mid-transit on April 20 at $5^h\ 22^m$, nearly two hours before sunset. Its rotation period was about 14 seconds longer than that of the Red Spot, and it evidently participated in the motion of the N. Temperate current rather than in that of the usual N. Tropical Spots, which rotate in about 10 seconds less time than the Red Spot.

Equatorial Spots.—These consisted of the normal white and dark markings alternating on the N. side of the Great S. Equatorial Belt. Their mean period of rotation proved to be a few seconds in excess of the rate exhibited during the previous eight years.

Great Red Spot.—This appeared very faint and indefinite except under very sharp definition, when its oval outlines could be distinctly traced. The motion was a little irregular, but the spot was certainly not accelerated in any striking degree, when the Great S. Tropical Spot closely approached its eastern side. The junction of the *f* end of Red Spot with *p* end of the S. Tropical Spot occurred on about March 5, for no division between them could be remarked on that date.

Great S. Tropical Spot.—A transit of the ends of this extensive disturbance, obtained on 1905 August 7, indicated its length as 43°·5, but a rapid distension thereafter occurred, for on September 13 the length was 49°·6, and on October 19, 58°·6. A further increase was noted in ensuing months, but it was of relatively trifling character. This longitudinal growth of the marking evidently occurred at the following end; for while the *p* end rotated at the normal rate, the *f* end showed a considerable retardation, the period being 4 seconds greater. The dark material of the fore part of the Spot was passing S. of the Red Spot in March and April, and the dark front of the former was not due on the *p* side of the latter until about the middle of 1906 May; but as early as April 19 there was a dusky patch extending from 351° to 11°, and well in advance of the Red Spot. I had observed this indistinctly on several previous occasions in April, but its feebleness caused me to question its relationship with the much darker aspect of the old S. Tropical Spot. If identity is assumed then its translation from the *f* to the *p* side of the Red Spot must have been exceedingly rapid and fully bears out the suggestion of Major P. B. Molesworth (*Monthly Notices*, lxvi. p. 102).

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A brilliant white spot usually precedes the Great S. Tropical disturbance, and the former apparently passed round the *northern* side of the Red Spot. It was seen on 1906 February 21 N. *f* the Red Spot, and its longitude on four other nights was: March 5, 47°·8; April 12, 23°·2; April 19, 24°·1; April 29, 17°·1.

S. Temperate Spots.—As usual there were several large white spots fringing the S. border of the S. Temperate Dark Belt. Some of these markings appear to have existed for a long period, though little effort has been made to identify the same individual features during many successive apparitions. This, however, now admits of easy attainment from the abundance of materials accumulated in recent years. In *The Observatory*, 1904, September (vol. xxvii. p. 345), I gave some data with regard to two of these objects which had been followed during several years. They are still visible at the present time.

During the past apparition the S. Tropical Zone usually appeared to be the brightest region of the disc, whereas in 1903 the equatorial zone was more luminous than any other.

Observations of *Jupiter* in bright sunshine are sometimes very effective. On many occasions I have seen the principal markings beautifully defined at about 2^{h} or $1\frac{1}{2}^{h}$ before sunset. But the best time for examination of Jovian detail is near the time of sunset, when the spots and irregularities in the belts are often presented with remarkable distinctness. Whenever daylight observations of *Jupiter* are attempted care must be taken to protect the tube of the telescope from the direct rays of the Sun. Equatorial mounting is not necessary, as the planet can generally be swept up in very few minutes with a low-power eyepiece.

Several observers have reported an annoying prevalence of bad definition during the past winter, but this has been quite contrary to my experience. The high altitude of the planet, as compared with its comparatively low position in the few previous years, has favourably influenced the character of the seeing, for my figures for 1903 and 1905–6 are:—

	Nights of Observation.	Very Good.	Good.	Fair.	Bad.	Very Bad.
1903	109	9	21	21	40	18
1905–6	88	17	25	22	17	7

The instrument employed in 1903 was a 10-inch With-Browning reflector, power 312. In 1905–6 I also used a $12\frac{1}{2}$-inch Calver reflector, powers 200, 315, and 440.

Bishopston, Bristol:
1906 *May* 10.

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Observation of Jupiter's Sixth and Seventh Satellites from Photographs taken with the 30-inch Reflector at the Royal Observatory, Greenwich, in 1905–6.—II.

(*Communicated by the Astronomer Royal.*)

In a preliminary paper in the *Monthly Notices* for 1905 November provisional results were given from the photographs obtained up to November 7. Further photographs of the sixth and seventh satellites have since been secured, and the more accurate method of measurement indicated in the preliminary note has been applied to the whole series.

As there explained, the positions of the satellites have been measured on the photographs taken with the reflector with reference to three or four faint comparison stars (of eleventh or twelfth magnitude) symmetrically distributed round the satellite. The positions of these faint comparison stars were then measured relatively to the reference stars (of eighth to ninth magnitude) in the Astronomische Gesellschaft Catalogue (Berlin Zone) from photographs (with 20 minutes' exposure) taken with the astrographic 13-inch refractor, the field sensibly free from distortion being much larger with this telescope than with the reflector, so that from twelve to sixteen reference stars were available on each plate.

As *Jupiter* moved slowly it was possible to make one reference plate serve for a number of photographs, which were each referred to it. The constants were determined in the usual manner, all the stars on the plate given in the Astronomische Gesellschaft Catalogues being used for the purpose. Right ascensions and declinations of the satellites were then determined and, by comparison with the tabular positions of *Jupiter*, position angles and distances deduced.

Ten photographs to determine the errors of the tabular place of *Jupiter* were taken between 1905 November 3 and 1906 February 15 with the Astrographic Equatorial. Corrections have been deduced from these, but the discussion is not yet complete. They show, however, that the errors of the tabular place of *Jupiter* are very small, and this result is confirmed by the observations with the transit circle and with the altazimuth.

Observations of Satellite VI.

Date and G.M.T.	Apparent R.A.	Apparent Dec.	Pos. Angle.	Dist.	Exp.	No. Plate.
1905. d h m	h m s	° ′ ″	° ′	′ ″	m s	
Aug. 23 13 30	4 10 42·567	+20 26 41·62	310 42·3	25 30·0	30 0	2028
23 14 23	4 10 43·162	+20 26 43·01	310 33·9	25 33·2	31 30	2029
Sept. 3 15 17	4 13 37·103	+20 32 25·60	291 12·1	36 54·4	40 0	2038
7 14 26	4 14 20·651	+20 32 56·45	286 34·2	40 48·4	60 0	2047
7 15 32	4 14 21·184	+20 32 56·78	286 32·0	40 49·8	55 0	2048